

THE GENOTYPES OF THE NORTH AMERICAN HADENINÆ (LEPIDOPTERA, NOCTUIDÆ)

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In the December 1933 issue of the JOURNAL OF THE NEW YORK ENTOMOLOGICAL SOCIETY (pages 441-456), the writer published a list of the genotypes of the North American Hadeninæ. This list also stated when and by whom these types were designated. That article with some additions forms the basis for the present paper.

Probably no group of insects needs a more careful revision than the Noctuidæ (Phalenidæ). Such a task is not easy because so many species are involved. Many have tried to group these species into genera but few workers agree upon what constitutes a genus. This lack of harmony has led to confusion. Many specialists will accept a genus even though they may not be able to define it. Most of the recently erected genera have been well described and defined but the older ones need to be redescribed and their boundaries more clearly set. To properly define a genus, one should consider all morphological characters even if they seem to have no generic value. This may make the generic description rather lengthy but the information contained in such a description will be of great value to those who wish to make a critical comparison of related genera. The salient characters could be listed first—say in italics—so that it would be unnecessary to read through the entire description.

Where should one begin in forming generic concepts? The writer believes that the genotypes offer a good starting point. Having worked out their structure, we now have morphological “yardsticks” with which we can measure other species and see where they fit. It is true that no one species can show the range of variation within the genus but we may start with one species and group others about it. Having done this, we may turn back and elaborate upon our original generic concept. It is the aim of this article to describe these basic species in the North American

Hadeninae so that others may supplement it with a morphological study of species other than genotypes.

SCOPE OF THE ARTICLE

This article includes the following—First—most of the Hadenine genera found in North America; Second—all genera considered synonymic with our genera; Third—a few purely exotic genera which have found their way in our lists from time to time. Some of the latter group have been considered synonymic with our genera and in a few cases our genera have been considered synonymic with them.

In the first group we have the following—Acerra Grt., Admetovis Grt., Anarta Ochs., Barathra Hub., Borolia Moore, Buchholzia Barnes and Benj. (Eubuchholzia B. and B.), Cardepiia Hampson, Cea Grt., Ceramica Gn., Chabuata Walk., Copinamestra Grt., Craterestra Hamp., Discestra Hamp., Engelhardtia Barnes, Epia Hub., Eriopyga Gn., Eupsephopaectes Grt., Faronta Smith, Hadena Schrank, Heliophila Hub., Himella Grt., Hyperepia Barnes and Lind., Lasiestra Hamp., Lasionycta Auriv., Leucania Ochs., Lophoceramica Dyar, Mamestra Ochs., Miodera Smith, Morrisonia Grt., Neleucania Smith, Nephelodes Gn., Ommatostola Grt., Parameana Barnes and Benj., Perigonica Smith, Perigrapha Lederer, Pseudorthodes Morrison, Scotogramma Smith, Stretchia Hy. Edw., Trichoclea Grt., Trichocosmia Grt., Tricholita Grt., Trichopolia Grt., Ulolonche Smith, Ursogastra Smith, Xanthopastes Hub., Xylomania Hamp., Zosteropoda Grt.

In the second group: Synonym for Eriopyga-Hypotrix Gn., Synonyms for Hadena-Aethria Hub., Aplecta Gn., Astrapetis Hub., Crocigrapha Grt., Dargida Walk., Dianthoecia Bois., Diataraxia Hub., Neuria Gn. Incorrectly considered synonymic with Mamestra Aletia Hub., Alysia Gn., Charaeas Steph., Haderonia Staud., Hyphilare Hub., Hyssia Gn., Melanchra Hub., Meterana Butl., Synonymic with Nephelodes Monosca Walk., Monostola Alpher., Synonymic with Xanthopastes Philochrysa Grt. The exact status of all of these genera will be considered in the article.

In the third group Neuronion Hub. (Epineuronion Staud.), Eury-

psyche Butl., Ichneutica Mey., Magusa Walk., Meliana Curtis, Naesia Walk., Pastona Walk., Sideridis Hub., Xylomyges Gn.

DESCRIPTION AND DESIGNATION OF MORPHOLOGICAL CHARACTERISTICS

In this section each morphological character will be described and given a type number, *e. g.* frons type 1, male antennæ type 2, etc. Throughout the article these type numbers will be used in describing the genotypes—not because the writer prefers this method—but to save space and to reduce the cost of publication.

The Head

Vestiture.

Type 1—hair.

Type 2—hair and scales.

Type 3—scales.

Type 4—deeply cleft scales.

Compound Eyes.

Type 1—apparently naked.

Type 2—hair restricted to the posterior portion of the eye.

Type 3—uniformly clothed with hair.

Frons.

Type 1—rather uniformly rounded.

Type 2—tends to project forward and upward.

Type 3—tends to project forward and downward.

Type 4—protrudes forward, not rounded, front almost vertical.

Type 5—protrudes slightly forward and downward, with indications of a slight “T” shaped protuberance.

Type 6—rounded and full, front slightly excavated.

Type 7—uniformly rounded, ventral margin with a knob-like prominence.

Type 8—with an inverted heart shaped protuberance which is smooth on its frontal surface.

Type 9—with an inverted heart shaped protuberance that is roughened on its frontal surface.

Type 10—with a truncated conical corneous process.

Type 11—with a semi-lunate corneous prominence raised at its edges.

Type 12—extends forward and upward in the form of an inverted wedge which bears near its apex a smaller wedge-shaped prominence. Ventral margin with an upturned corneous ridge.

Type 13—protrudes forward and upward with the frontal surface convex.

Antennæ of the male.

Type 1—filiform, scaled above, ventral surface clothed with fine cilia to long hair, setæ may or may not be present. Antennæ round or oval in cross section, sometimes flattened on the ventral surface.

Type 2—filiform and similar to type 1 except that the antennæ are wedge-shaped in cross section.

Type 3—crenulated, scaled above, clothed with very long cilia beneath. Each segment bears a pair of very long lateral setæ.

Type 4—crenulated, scaled above, ventral surface of the crenulations bearing short cilia. At the tip of each crenulation there is a pencil of very long hair.

Type 5—crenulated and flattened, scaled above, ventral surface of the crenulations along their distal margins bear long hair. At the extremity of each crenulation there is a stiff seta which is more or less hidden by the hairy vestiture.

Type 6—crenulated, scaled above, bearing fine cilia beneath. At the tips of the crenulations are pencils of long hairs no lateral setæ present.

Type 7—crenulated, dorsal surface scaled, ventral surface covered with short hair. Each crenulation bears at its tip a tuft of long hair and a setum.

Type 8—serrate, clothed above with scales and ventrally with a combination of fine cilia long hairs. The hairs are restricted to the distal portions of the segments.

Type 9—serrate, the serrations formed by wedged-shaped prominences on the ventral surface of the shaft. These prominences are clothed with long hair and a pair of lateral setæ. Dorsally the antenna is scaled.

Type 10—serrate, almost bipectinate, dorsal surface scaled, ventral surface covered with hair with longer bristles of hair on the tips of the serrations and on their mid-ventral surfaces. Serrations not of the same size on both sides of the antenna.

Type 11—bipectinate but not flattened, pectinations not of the same size on both sides of the shaft, even the longer ones quite short. At the end of each branch there is a rather prominent setum. The antenna is scaled above, finely ciliated beneath with the exception of the pectinations which are clothed beneath with long hair.

Type 12—flattened and bipectinate, pectinations not of the same size on both sides of the shaft. Dorsal surface scaled, ventral surface clothed with long hair. At the tips of each pectination there is a very prominent seta. Ventral surface of the shaft serrated.

Type 13—bipectinate, pectinations not of the same size on both sides of the shaft. Dorsal surface scaled, ventral surface clothed with long hair. Each pectination terminated with a prominent seta. Ventral surface of the shaft crenulated.

Type 14—bipectinate and serrate, pectinations longer on one side than the other. Antenna scaled above, ventral surface of the shaft and pectinations clothed with long hair. At the end of each pectination there is a rather stout seta.

Type 15—bipectinate, pectinations not of the same size on both sides of the shaft. Dorsal surface of the antenna scaled, ventral surface of the shaft and pectinations clothed with long hair.

Type 16—bipectinate, pectinations not of the same size on both sides of the shaft. Segments very distinct on their dorsal surface which is clothed with scales. Ventral surface of the shaft and the pectinations clothed with very long hair. Hair at the tips of the pectinations a trifle longer.

Type 17—bipectinate, pectinations not of the same size on both sides of the shaft. Antenna scaled above, ventral surface of the shaft and the pectinations clothed with moderately long hair.

Type 18—bipectinate, the pectinations not of the same size on both sides of the shaft. Antenna scaled above, ventral surface of the shaft and pectinations clothed with long hair. At the tips of each pectination there are three prominent setæ.

Type 19—bipectinate, pectinations not of the same size on both sides of the shaft. Antenna scaled above, ventral surface of the shaft and of the pectinations clothed with short hair. At the tips of each pectination there are two or three short setae.

Type 20—bipectinate, pectinations equal on both sides of the shaft. Antenna scaled above, ventral surface of the shaft and the pectinations clothed with long hair. No setæ at the tips of the pectinations.

Type 21—bipectinate, pectinations almost the same size on both sides of the shaft. Antenna scaled above, ventral surface of the shaft and the pectinations clothed with long hair. Each pectination bears at its tip a prominent seta.

Type 22—bipectinate, pectinations of the same size on both sides of the shaft. Antenna scaled above, ventral surface of the shaft and the pectinations covered with short hair. Each pectination bears at its tip a prominent seta.

Type 23—bipectinate, pectinations of the same size on both sides of the shaft. Antenna scaled above, ventral surface of the shaft and the pectinations clothed with long hair. Each pectination bears at its tip two or three prominent setae. Shaft serrate ventrally.

Type 24—bipectinate, pectinations of the same size on both sides of the shaft. Antenna scaled dorsally, ventral surface of the shaft and the pectinations covered with short hair. Each pectination bears at its tip several prominent setæ.

Antennæ of female.

Type 1—filiform, scaled above, vestiture of the under side varies from long hair to fine cilia. Setæ may or may not be present. Antennæ oval or round in cross section.

Type 2—filiform, scaled above, vestiture beneath varies from long hair to fine cilia. Setæ may or may not be present. Antennæ wedge shaped in cross section.

Type 3—serrate when viewed from the side, ventrally each segment is heart-shaped, the upper lobes bearing several prominent setæ. Dorsally scaled, ventral surface covered with fine cilia.

Type 4—crenulated, scaled above, finely ciliated beneath. Each segment bears at least one pair of long setæ near its distal extremity.

Type 5—serrate, dorsally scaled, ventrally clothed with moderately long hair. Each segment bears a pair of prominent setæ.

Type 6—serrate and flattened. Dorsally scaled, ventral surface covered with long hair. Each segment bears a pair of lateral setæ.

Type 7—serrate, the serrations not of the same size on both sides of the shaft. Dorsal surface clothed with scales, ventrally covered with fine hair. Each segment bears a pair of very long lateral setæ.

Type 8—bipectinate, pectinations short and of the same size on both sides of the shaft. Dorsally scaled, ventral surface of the shaft and the pectinations clothed with long hair. Each pectination bears at its tip a prominent seta.

Type 9—bipectinate, pectinations long and of the same size on both sides of the shaft. Dorsally scaled, ventral surface of the shaft and the pectinations covered with short hair. Each pectination bears at its tip a prominent seta.

Vestiture of the palpi.

Type 1—all segments compactly scaled.

Type 2—all segments scaled.

Type 3—proximal segment bearing a mixture of hair and scales, all other segments scaled.

Type 4—proximal and middle segments bears a mixture of hair and scales, distal scaled.

Type 5—all segments bearing a mixture of hair and scales.

Ratio of the palpal segments.

Type	Distal	Middle
1	1.0	.75-1.9
2	1.0	2.00-2.90
3	1.0	3.00-3.90

Proboscis.

Type 1—fully developed.

Type 2—poorly developed or weak.

The Thorax

Vestiture of the thorax.

Type 1—hair.

Type 2—hair and scales.

Type 3—scales.

Crests.

Type 1—none.

Type 2—a prothoracic crest present; others, if present, indistinct.

Type 3—indistinct pro- and meta-thoracic crests.

Type 4—indications of meta-thoracic crest.

Type 5—a divided pro- and a distinct meta-thoracic crest.

Type 6—a divided pro-, a meso-, and a meta-thoracic crest.

Costal margin of the primaries.

Type 1—straight.

Type 2—straight but lobed at the base.

Type 3—slightly convex.

Type 4—concave.

Apex of the primaries.

Type 1—truncated.

Type 2—rounded.

Type 3—drawn downward, sometimes to a point.

Type 4—pointed.

Outer margin of the primaries.

Type 1—straight to very obliquely incurved.

Type 2—slightly convex.

Type 3—rounded outwardly at the tips of veins M_2 and M_3 , very oblique to anal margin.

Type 4—rounded outwardly at the tips of veins M_3 and Cu_1 , very oblique to anal margin.

Type 5—excavated to the middle where it forms a distinct angulation.

Sc and R of the secondaries.

Type 1—Sc and R confluent at their bases.

Type 2—Sc and R touching near the base of the wing, then diverging.

Vestiture of the fore-leg.

Type 1—femur of the fore-leg fringed with coarse hair beneath, remainder of the leg scaled.

Type 2—leg scaled throughout, not fringed with hair.

Structure of the fore-leg.

Type 1—typical in structure, *i.e.*, with only the usual spines present. (See Fig. 268.)

Type 2—fore-tibia with a curved claw on the outer side.

Type 3—a large curved spine near the distal end of the first tarsal segment, all spines on the first and second tarsal segment overdeveloped.

Type 4—one or two curved claws on the anterior face of the fore-tibia, also a large curved spine at the distal extremity of the first tarsal segment.

Type 5—the distal portion of the tibia bearing several large spurs on the anterior and posterior faces.

Type 6—tibiæ with several short spines.

Type 7—with at least three very large spines on the outer side of the first tarsal segment, on the succeeding two segments the spines are overdeveloped on the outer side.

Vestiture of the middle leg.

Type 1—scaled, ventral edge of the femur and dorsal margin of the tibiæ fringed with coarse hair and long scales.

Type 2—scaled throughout, not fringed with hair.

Structure of the middle leg.

Type 1—typical in structure, *i.e.*, with only the usual spines on the tarsi and the two spurs on the tibia. (See Fig. 269.)

Type 2—tibiæ with several short spines rather evenly distributed.

Vestiture of the hind leg.

Type 1—as type 1 of the middle leg.

Type 2—as type 2 of the middle leg.

Structure of the hind leg.

Type 1—typical in structure, *i.e.*, with only the usual spines on the tarsi and four spines on the tibia. (See Fig. 270.)

Type 2—as type 2 of the middle leg.

The Abdomen**Vestiture of the abdomen.**

Type 1—hair dorsally and ventrally.

Type 2—dorsally hair, ventrally mixed hair and scales.

Type 3—dorsally hair, ventrally scaled.

Type 4—dorsally mixture of hair and scales, ventrally mostly scales.

Type 5—dorsally mixture of hair and scales, ventrally hair.

Type 6—dorsally and ventrally mixture of hair and scales.

Type 7—dorsally and ventrally scaled.

Dorsal abdominal crests.

Type 1—none.

Type 2—poorly defined.

Type 3—one on the first segment.

Type 4—a crest on the first and second segments.

Type 5—a crest on the first, indications of crests on the second and third.

Type 6—crests on the first, second, and third segments.

Type 7—a row of mid-dorsal crests.

Lateral abdominal crests.

Type 1—none present.

Type 2—crests indistinct.

Type 3—present and distinct.

KEY TO THE GENOTYPES

In making this key the writer has avoided, as far as possible, the use of such sexual characters as the structure of the male or female antennæ. To do this it was sometimes necessary to make distinctions on the basis of the vestiture of the head or thorax or even the presence or absence of thoracic and abdominal crests. The use of such characters in the key is merely for convenience and they are not to be considered of primary importance in generic classification.

It is hoped that this key can be used to classify the many North American species of Hadeninæ other than genotypes.

1. Eyes apparently naked, *i.e.*, clothed with very fine cilia2
 Eyes clothed with short hair that is confined to the posterior portion.....4
 Eyes clothed with hair that is uniformly distributed6
2. Frons protrudes forward and upward with the frontal surface convex.
 Parameana
 Frons rather uniformly rounded although sometimes rather prominent...3
3. Legs rather compactly scaled, antenna of the male serrate.....*Ommatostola*
 Legs fringed with long hair and scales, antenna of male filiform.
 Buchholzia
4. Vestiture of the thorax a mixture of hair and scales5
 Vestiture of the thorax scales*Trichopolia*

5. Apex of the primaries truncated, antennæ of the male bipectinate, of the female filiform *Lophoceramica*
 Apex of the primaries rounded, antenna in both sexes bipectinate. *Tricholita*
 Apex of the primaries drawn downward, antenna of the male filiform. *Ursogastra*
6. Frons uniformly rounded, ventral margin with knob-like prominence. *Xanthopastes*
 Frons uniformly rounded, ventral margin without a knob 7
 Frons not uniformly rounded 24
7. Proboscis fully developed 8
 Proboscis poorly developed 22
8. Costal margin of the primaries straight 9
 Costal margin of the primaries straight but lobed at the base. *Utolonche*
 Costal margin of the primaries slightly convex 16
 Costal margin of the primaries slightly concave 20
9. Outer margin of the primaries straight to obliquely incurved 10
 Outer margin of primaries rounded outwardly at the tips of veins M_2 and M_3 very oblique to anal margin *Pastona*
 Outer margin of the primaries rounded outwardly at the tips of M_3 and Cu_1 very oblique to the anal margin *Hypotrix*
 Outer margin of the primaries excavated to the middle where it forms a distinct angulation *Perigonica*
10. Fore leg with only the usual spines 11
 Fore leg with at least three very large spines on the outer surface of the first tarsal segment, on the next two segments the spines on the outer side are overdeveloped *Admetovis*
11. Vestiture of the head hair only 12
 Vestiture of the head hair and scales or scales only 15
12. Vestiture of the thorax hair only 13
 Vestiture of the thorax hair and scales or scales only 14
13. Apex of the primaries drawn downward, vestiture of the abdomen hair and scales dorsally and ventrally *Acerra*
 Apex of the primaries truncated, dorsal surface of the abdomen covered with hair, ventral surface with hair and scales *Alysia*
14. No dorsal abdominal or thoracic crests *Heliophila*
 Thoracic and dorsal abdominal crests present *Chabuata*
15. (a) Antenna of the male filiform, oval or round in cross section. *Melanchra* group
 (b) Antenna of the male filiform, wedge-shaped in cross section. *Pseudorthodes* and *Hadena* group
 (c) Antenna of the male crenulated, ventral surface bears short cilia, pencils of long hairs at the tips of the crenulations *Xylomyges*
 (d) Antenna of the male crenulated and flattened, scaled above, ventral surface of the crenulations along their distal margins bearing

- long hair, at the extremity of each crenulation there is a stiff seta *Morrisonia*
- (e) Antenna of the male bipectinate, not flattened, pectinations not of equal size on opposite sides of the shaft and all quite short, ventral surface ciliated and at the end of each pectination there is a long setum *Nephelodes*
- (f) Antenna of the male bipectinate, not flattened, pectinations not of equal size on opposite sides of the shaft, dorsal surface scaled, ventral surface clothed with long hair. Each pectination bears at its tip a prominent setum. Ventral surface of the shaft crenulated *Stretchia*
- (g) Antenna of the male bipectinate and flattened, pectinations not of equal size on opposite sides of the shaft, ventral surface clothed with long hair. At the tip of each pectination there is a stout setum. Ventral surface of the shaft serrate *Hyperopia*
- (h) Antenna of the male bipectinate and serrate but not flattened. The pectinations longer on one side of the shaft than the other. Antenna scaled above, ventral surface clothed with long hair. There is a stout setum at the tip of each pectination *Haderonia*
16. Vestiture of the legs compact scales *Meliana*
Vestiture of the legs hair and scales 17
17. Apex of the primaries drawn downward *Eriopyga*
Apex of the primaries truncated 18
18. Vestiture of the palpi scales only *Borolia*
Proximal and middle segments of the palpi bearing hair and scales, distal segment scaled 19
19. Antenna of the male filiform, middle segment of palpi more than twice the length of the distal *Naesia*
Antenna of the male crenulated, middle segment of the palpi not more than twice the length of the distal *Himella*
20. Apex of the primaries truncated *Anarta*
Apex of the primaries pointed 21
21. Palpi with the proximal segments clothed with hair and scales. *Zosteropoda*
Palpi with all segments compactly scaled *Neleucania*
22. Outer margin of the primaries slightly convex *Charaeas*
Outer margin of the primaries straight or obliquely incurved 23
23. Vestiture of the head and thorax hair *Monostola*
Vestiture of the head and thorax hair and scales or scales only. *Epineuronia*
24. Frons projects forward and upward 25
Frons projects forward and downward 32
Frons protrudes forward and downward with indications of a slight "T" shaped protuberance *Epia*
Frons rounded out, front slightly excavated *Ichneutica*

- Frons with an inverted heart shaped protuberance which is smooth on its frontal surface *Trichoclea*
- Frons with an inverted heart shaped protuberance which is roughened on its frontal surface *Miodera*
- Frons extends forward and upward in the form of an inverted wedge which bears near its apex a prominence *Cea*
- Frons with a truncated conical prominence *Craterestra*
- Frons with a semi-lunate prominence with raised edges *Discestra*
25. Proboscis fully developed 26
- Proboscis poorly developed 31
26. Costal margin of the primaries straight 27
- Costal margin of the primaries straight but lobed at the base. *Lasiestra*
- Costal margin of the primaries slightly convex *Eurypsiche*
27. Fore leg with only the usual spines 28
- Fore leg with a curved claw on the outer side. *Mamestra* and *Copimamestra*
28. Legs compactly scaled *Trichocosmia*
- Legs fringed with hair and scales 29
29. Antenna of the male bipectinate, of the female serrate *Xylomania*
- Antennæ in both sexes filiform 30
30. No distinct thoracic crest *Cerdepia*
- Distinct thoracic crest *Barathra* and *Scotogramma*
31. Apex of primaries truncated, thoracic crests present *Perigrapha*
- Apex of primaries drawn down, no thoracic crests *Engelhardtia*
32. Outer margin of the primaries straight or very obliquely incurved, vestiture of the thorax hair *Sideridis*
- Outer margin of the primaries slightly convex, vestiture of the thorax scales *Neuria*

The Hadeninæ

The Noctuidæ can be divided into two groups on the basis of the development of vein 5 (M_2) of the hind wing. By far the greater number belong to the group in which this vein is well developed but in four subfamilies *i.e.*, Hadeninæ, Cucullianæ, Agrotinæ, and Acronyctinæ, vein 5 is obsolescent from the middle of the discocellulars. It can be seen from this that the Hadeninæ are closely related to three other subfamilies. Hampson gives the following key for the separation of the four subfamilies.

- “A¹ Mid and hind tibiæ or hind tibiæ only spined Agrotinæ
- B¹ Mid or hind tibiæ not spined.
- A² Eyes hairy Hadeninæ
- B² Eyes not hairy.
- A³ Eyes overhung with cilia Cucullianæ
- BB³ Eyes not overhung with cilia Acronyctinæ”

A more complete description of the Hadeninæ, taken from Hampson, is as follows: "Proboscis usually well developed, sometimes aborted; palpi usually short, upturned or porrect; frons often with rounded prominence with corneous plate below it, or with corneous processes of various forms; eyes hairy, sometimes overhung by long cilia; antennæ usually ciliated, often pectinated or serrate. Thorax clothed with hair and scales when there are usually crests on the pro- and meta thorax, or a ridge like dorsal crest, or clothed with hair only; tibiæ without spines, the fore tibia rarely with terminal spine, the proximal joints of the fore tarsi sometimes with curved claw-like spines, abdomen usually with series of dorsal crests or one crest at the base. Wings usually broad, the termen rounded or crenulate, rarely slightly angulated at the middle; fore wing with vein 1a weak, not anastomosing with 1b; 1c absent; 2 from middle of cell; 3 and 5 from near lower angle; 6 from upper angle; 9 from 10 anastomosing with 8 to form the areole; in *Erana* with 7, 8, 9, stalked; 10 from cell. Hind wings with veins 1a and 1b present, 1c absent; 3 and 4 from lower angle of cell; 5 obsolescent from or from just below the middle of the discocellulars; 6, 7 from upper angle or shortly stalked; 8 arising free then bent down touching the cell then again diverging. In several genera the males often have secondary sexual tufts of hair or fans of scales on the thorax, legs or abdomen and in the genus *Eriopyga* patches of androconia on the wings of very diverse forms. In *Cirphis* the underside is sometimes clothed with slivery metallic scales."

Of the characteristics mentioned above, many of which are not peculiar to the Hadeninæ, the vestiture of the eyes and the spinosity of the tibiæ deserve further consideration.

In the typical Hadeninæ, the eyes are evenly clothed with hair which may be long or short. However, this characteristic is not constant for the entire subfamily for in three genera the eyes appeared to be naked (Dr. Barnes claims that hair is present but very fine and difficult to see) and in four other genera the hair is present but confined to the posterior portion of the eye.

As a rule the tibiæ of the Hadeninæ are not provided with spines the spinose condition being found chiefly in the Agrotinæ. However one genus whose hairy eyes place it in the Hadeninæ, shows developed spines or claws on the tibiæ.

It would seem from what has been said concerning the vestiture of the eyes and the spinosity of the tibiæ, that there are several Hadenine genera which stand between the true Hadeninæ and its allied subfamilies. This fact has some bearing upon the arrangement of the genera in this article. Since the members of the related subfamilies have naked eyes, the writer assumes that the stock from which the Hadeninæ arose also had naked eyes. This idea seems to be supported by the fact that in three genera the cilia upon the eyes are so fine that the eyes appear to be naked. In four other genera the eyes are only partly clothed with hair.

The spinosity of the fore tibia is also an unusual character among the Hadeninæ and may indicate relationship to the Agrotinæ. If the Agrotinæ and Hadeninæ are closely related, say through a common ancestor, then the one Hadenine genus in which the fore tibia is spined should be considered first. This is the reason for placing *Mamestra* (*Copimamestra*) first. This genus has, however, taken on the Hadenine character of hairy eyes. Another line of development is indicated by *Buchholzia*, *Ommatostola*, and *Parameana* in which the spinose condition of the fore tibia is lost but the eyes are almost naked and the writer believes that in some specimens they are naked. These three genera must also be considered as standing close to the base of the Hadenine stem and for this reason they form the second group to be considered. The *Buchholzia* group seem to lead into forms in which the eyes are partly clothed with hair so this group is followed by *Ursogastra*, *Lophoceramica*, *Tricholita*, and *Trichopolia* in which the hair is confined to the posterior part of the eye.

Next comes the bulk of the genera that are typical Hadenines having uniformly hairy eyes and no tibial spines or claws. There are many ways in which these could be divided but the writer has chosen to arrange them on the basis of wing form—those in which the outer margin is more or less even and those in which the outer margin is produced in the form of a lobe or angulated. The former section, normal wing form, can be further divided into two groups: (1) those with enlarged spines on the first tarsal segment, (2) those in which all tarsal spines are normal in their development.

The genera are accordingly grouped in the following sequence.

Eyes uniformly hairy

Group 1—Fore tibia armed with a distinct claw—*Mamestra* (*Copimamestra*).

Tibiæ without claws

Group 2—Eyes naked or apparently so—*Eubuchholzia*, *Parameana*, and *Ommatostola*.

Group 3—Eyes partly clothed with hair—*Ursogastra*, *Lophoceramica*, *Trichopolia*, and *Tricholita*.

Eyes uniformly hairy

Group 4—Margin of the fore wing produced—*Perigonica*, *Pastona*, and *Hypotrix*.

Group 5—Margin not produced, fore tarsi with enlarged spines—*Epia* and *Admetovis*.

Group 6—Margin not produced, tarsi without enlarged spines. This group can be divided as follows:

Section A—Frons uniformly rounded

Subsection I—Antennæ simple in both sexes (filiform).

(a) Antennæ of the male oval in cross section—*Anarta*, *Chabuata*, *Ulolonche*, *Aletia*, *Zosteropoda*, and *Neleucania*, *Melanchra*.

(b) Antennæ of the male wedge-shaped in cross section—*Hadena*, *Eriopyga*, *Pseudorthodes*, *Naesia*, *Borolia*?, *Meliana*, and *Heliophila*.

Subsection II—Antennæ of the male never filiform—*Morrisonia*, *Xylomyges*, *Himella*, *Alysia*, *Hyperepia*, *Nephelodes*, *Monostola*, *Charaeas*, *Haderonia*, *Epineuronia*, *Acerra*, *Stretchia*.

Section B—Frons not uniformly rounded

Subsection Ia—Antennæ of the male never filiform—*Perigrapha*, *Xylomania*, *Engelhardtia*, *Lasiestra*, and *Eurypsyche*.

Subsection Ib—Antennæ of the male filiform—*Cardepiæ*, *Trichocosmia*, *Barathra*, *Scotogramma*, *Dianthoecia*, *Sideridis* and *Neuria*.

Subsection IIa—Frons ornamented or excavated, antennæ of the males simple—*Xanthopastes*, *Craterestra*, *Discestra*, *Cea*, and *Trichoclea*.

Subsection IIb—Frons ornamented but the antennæ in both sexes not simple—Ichneutica and Miodera.

Group I

This group includes *Mamestra* Ochs. and its equivalent *Copimamestra* Grote. At first the writer considered *Noctua persicariæ* Linn. as the genotype of *Mamestra* on the basis of Westwood's designation in 1839 (Synopsis of the Genera British Insects, page 95.) but Dr. McDunnough of the Canadian Bureau of Entomology pointed out to the writer that the type was designated 1829 by Duponchel as *Noctua brassicæ* Linn. (Godart's and Duponchel's *Historie Naturelle des Lepidopteres*, VII, Part II, pp. 71-72.) In 1883, Grote erected the genus *Copimamestra* in which he included *brassicæ* Linn and a new species *occidentæ* Grt. He mentions the curved claw on the fore tibia as the chief characteristic and goes on to say, "The types are the European *C. brassicæ* and the following new species." Hampson in 1905 designated *brassicæ* as the type of *Copimamestra* which is in harmony with Grote's statement so it may be considered as genotype of *Copimamestra*. This makes *Copimamestra* the equivalent of *Mamestra*, both having the same species for genotype.

Noctua brassicæ Linn has the characteristic hairy eyes of a Hadenine but also possesses the unusual claw-like structure on the fore tibia. This is an outstanding character which should serve to identify the genus.

Synopsis of Morphological Characters

Head:

Vestiture 2, Compound eyes 3, Frons 2, Antennæ male 1 hair beneath, of the female 1 ciliated beneath, Vestiture of the palpi 4, Ratio of the palpal segments 2, proboscis 1.

Thorax:

Vestiture 2, Crests 5, Primaries costa 1, apex 1, outer margin 1 (incurved), Secondaries 1, Vestiture of the fore leg 1, structure 2, Vestiture of middle and hind legs 1, structure of middle and hind legs 1.

Abdomen:

Vestiture 6, Dorsal crests in male 7 (1st to 5th), in the female 3, Lateral crests in the male 2, in the female 1.

Group II

In this group may be placed three genera, Eubuchholzia, Ommatostola, and Parameana. The type of Eubuchholzia is *Arsilonche colorada* Smith, of Ommatostola is *O. lintneri* Grt., and of Parameana, *Hadena laetabilis* Smith. In these three species the fore tibiae are without the claw found in Group I but the eyes are either naked or apparently so. The hairs between the facets are so small and so few in number that it is very easy to overlook them.

These genotypes can be separated in the following way:

1. Frons rather uniformly rounded 2
Frons projects forward and upward, frontal surface convex.
Parameana B. & Benj.
2. Antennae of the male filiform Eubuchholzia B. & Benj.
Antennae of the male serrate Ommatostola Grt.

Synopsis of Morphological Characters

	Para- meana	Eubuch- holzia	Ommato- stola
Head:			
Vestiture	3	2	3
Compound eyes	1	1	1
Frons	13	1	1
Antennae of male	×	2, hair and setae beneath	9
Antennae of the female	2, ciliated, no setae beneath	×	1, cilia and lat- eral and mid- ventral setae
Vestiture of palpi	4	4	2
Ratio of palpal segments...	2	2	2
Proboscis	1	1	1
Thorax:			
Vestiture	3	3	2
Crests	4	4	4
Costa of primaries	1	1	1
Outer margin of primaries	1, incurved	1, incurved	1, incurved
Apex of primaries	2	3	2
Sc. and R of secondaries	2	1	1
Fore leg—vestiture	1	1	2
“ “—structure	1	1	1
Middle leg—vestiture	1	1	2

“ “ —structure	1	1	1
Hind leg—vestiture	1	1	2
“ “ —structure	1	1	1
Abdomen :			
Vestiture	6	4	7
Dorsal crests	3	1	1
Lateral crests	1	2	3

Group III

In this group we have four genera which are more typically Hadenine in character. The fore tibiæ are not spurred and the eyes are markedly hairy but the hair in these genera is confined to the posterior portion of the eye. This group consists of the following genera: *Ursogastra* Smith (type *lunata* Smith), *Lophoceramica* Dyar (type *artega* Barnes), *Tricholita* Grote (type *semiaptera* Morr.), and *Trichopolia* Grote (type *dentatella* Grote). By looking over the synopsis of morphological characters, one will see that all four genotypes have much in common and that the best way to separate them on the basis of the structure of the antennæ. This may be done in the following way:

1. Antenna of the male filiform *Ursogastra* Smith
Antenna of male not filiform 2
2. Antenna of male bipectinate, pectinations the same size on both sides 3
Antenna of the male bipectinate and serrate, pectinations not of the same size on both sides of the shaft *Trichopolia* Grote
3. Antenna of the female filiform *Lophoceramica* Barnes
Antenna of the female bipectinate *Tricholita* Grote

Group IV

Members of this group have the eyes uniformly hairy, fore tibia without a claw. The outstanding characteristic in this section is the shape of the fore wings for in each of these genotypes the outer margin of the upper wings is produced. Here we find the genus *Perigonica* Smith-type *angulata* Smith, *Pastona* Walk.-type *rudis* Walk, and *Hypotrix* Gn.-type *purpurigera* Gn. *Rudis* and *purpurigera* are Brazilian species and the genera of which they are the types may have no representatives in North America. The genus *Magusa* of Walker has for its type *albiguttalis* Walker. According to Hampson, *albiguttalis* is a synonym of *rudis* so

Synopsis of Morphological Characters

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	Ursogastra	Lophoceramica	Tricholita	Trichopolia
Head:				
Vestiture	3	2	2	2
Compound eyes	2	2	2	2
Frons	1	1	1	1
Antennæ, male	1, under side flat, hairy, lateral setæ	22	22	14
Antennæ, female		1, under side ciliated, lat- eral setæ	9	1, under side ciliated, lat- eral setæ
Vestiture of palpi	3	4	4	4
Ratio of palpal segments		2	2	1
Proboscis	1	1	1	1
Thorax:				
Vestiture	2	2	2	3
Crests	4	5	5	5
Costa of primaries	1	1	1	1
Apex of primaries	3	1	2	1
Outer margin of primaries	1, incurved	1, incurved	1, straight	1, straight
Sc and R of secondaries		2	2	1
Fore leg—vestiture	1	1	1	1
“ “ —structure	1	1	1	1
Middle leg vestiture	1	1	1	1
“ “ structure	1	1	1	1
Hind leg—vestiture	1	1	1	1
“ “ —structure	1	1	1	1
Abdomen:				
Vestiture	7	4	4	4
Dorsal crests	1	3	3	3
Lateral crests	3	3 male, 2 female	3	3 male, 1 female

Magusa sinks as a synonym of *Pastona*. The genera may be separated in the following way:

1. Antenna of the male serrate, almost bipectinate *Perigonica* Smith
 Antenna of the male filiform 2
2. Apex of the fore wing rounded *Pastona* Walk.
 Apex of the fore wing drawn down to a point *Hypotrix* Gn.

Synopsis of Morphological Characters

	<i>Perigonica</i>	<i>Pastona</i>	<i>Hypotrix</i>
Head:			
Vestiture	1	3	1
Compound eyes	3	3	3
Frons	1	1	1
Antenna of the male	10	1, ciliated beneath lateral setæ	1, ciliated beneath lateral setæ
Antenna of the female.....	1, ciliated lateral setæ	1, fine cilia lateral setæ?	1, ciliated lateral setæ
Vestiture of the palpi	4	3	4
Ratio of the palpal segments	2	x	x
Proboscis	1	1	1
Thorax:			
Vestiture	2	3	3
Crests	5	5	5
Costa of primaries	1	1	1
Apex of primaries	4	2	3
Outer margin primaries	5	3	4
Sc. and R. of secondaries	x	x	x
Fore leg—vestiture	1	1	1
“ “—structure	1	1	1
Middle leg—vestiture	1	1	1
“ “—structure	1	1	1
Hind leg—vestiture	1	1	1
“ “—structure	1	1	1
Abdomen:			
Vestiture	6	7, male, 4, female	6, male, 4, female
Dorsal crests	2	1	1
Lateral crests	3	1	1

Group V

In this group we find two genera—*Epia* Hubner whose type is *echii* Bork, and *Admetovis* Grote with *oxymorus* Grote as its type. The first of these species is European and the genus may not be represented in this country. The other is native to the United States. Both species have the eyes uniformly hairy, fore tibiae without a claw, and wing form normal. The outstanding characteristic is the enlarged spines on the fore tarsi. If this character is not constant, then the species will fall in the next group. *Echii* has the frons protruding somewhat forward and downward with indications of "T" shaped protuberance. *Oxymorus* has the frons uniformly rounded. In *echii* the first tarsal segment of the fore tibia has a large curved spine near its distal end and all spines on the first and second tarsal segments are overdeveloped. In *oxymorus* the first tarsal segment of the fore tibia has at least three large spines on the outer side. On the succeeding two segments the spines are overdeveloped.

Synopsis of Morphological Characters

	echii	oxymorus
Head:		
Vestiture	2	2
Compound eyes	3	3
Frons	5	1
Antenna of the male	1, long hair and lat- eral setæ	2, long hair and lat- eral setæ
Antenna of the female	1, ciliated with lat- eral setæ	1, ciliated with lat- eral setæ
Vestiture of the palpi	2	4
Ratio of the palpal segments.....	2	2
Proboscis	1	1
Thorax:		
Vestiture	2	3
Crests	5	5
Costa of primaries	1	1
Apex " "	2	1
Outer margin "	1, straight	1, incurved
Sc. and R. secondaries	2	2

Fore leg—vestiture	1	1
“ “—structure	3	7
Middle leg—vestiture	1	1
“ “—structure	1	1
Hind leg—vestiture	1	1
“ “—structure	1	1
Abdomen :		
Vestiture	4	6, male ; 4, female
Dorsal crests	3	7
Lateral crests	3	2

Grote, in his original description of *Admetovis* mentions the pectinated condition of the antenna of the male. In specimens examined by the writer, the antenna was filiform. Smith, in Bull. 44, U. S. Nat. Mus. says, "The right of *Admetovis* to generic rank is decidedly questionable."

Group VI

In this group we find the greatest number of genera. Their genotypes have the eyes uniformly hairy, tibiæ without claws or spines, margins of the fore wings not produced. The species can be easily separated on the bases of their frons. In section A the frons is uniformly rounded, in section B the frons is produced sometimes forming some type of ornamentation.

Section A

Subsection I—Antennæ filiform in both sexes. Filiform antennæ are of two types. In one type the antenna is round or oval in cross section, in the other type ventral surface of each segment is raised to form a keel giving the antenna a wedge-shaped appearance when seen in cross section.

Subsection Ia—Antennæ of male oval

Costal margin of the fore wing straight	1
Costal margin of the fore wings lobed at the base.....	Ulolonche Smith
Costal margin of the fore wings concave	2

1. All segments of the palpi bearing scales only.

Hyphilare Hub., *Ceramica* Gn., *Chabuata* Walk., *Aletia* Hub.

Some segments of the palpi bearing a mixture of hair and scales 1a

- 1a. Apex of the fore wing pointedMeterana Butler
 Apex of the fore wing roundedMelanchra Hub., Hyssia Gn.
 2. All segments of the palpi bearing scales onlyNeleucania Smith
 Some segments of the palpi bearing a mixture of hair and scales..... 2a
 2a. Apex of the fore wings truncatedAnarta Ochs.
 Apex of the fore wings pointedZosteropoda Grote

Hyphilare, Ceramica, Chabuata, and Aletia

Hyphilare albipuncta Schiff., *Ceramica picta* Harris, *Chabuata ampla* Walk., and *Aletia vitellina* Hub. are the four genotypes. *Albipuncta* and *vitellina* are European; *picta*, North American; and *ampla* is found in Brazil. It is easy to understand why *Ceramica picta* is included in this article but a few words of explanation are needed to justify the inclusion of the others. All four species plus *Meterana pictula*, *Melanchra persicariae*, and *Hyssia cavernosa* have been considered associated with the genus Mamestra. Many workers, including the writer, have accepted Westwood's designation of the genotype of Mamestra as *persicariae* Linn. (Westwood, "Synopsis of the Genera of British Insects," p. 95, 1839-1840.) Dr. McDunnough of Canada informed the writer that the type of Mamestra was designated in 1829 by Duponchel as *brassicae* Linn. Since *brassicae* has a curved claw on the fore tibia, the genus Mamestra does not fit with these genera and the next oldest genus to take its place is Melanchra of Hubner with *persicariae* as its type—a monotypical genus. Melanchra with its palpi clothed with both scales and hair differs from Hyphilare, Ceramica, Chabuata, and Aletia, in which all the palpal segments are covered only with scales. These four will be considered first. In looking over the synopsis of morphological characters below, it will be noted that all four genotypes have much in common with each other yet not one agrees entirely with any other one. Hyphilare, Ceramica and Aletia resemble each other in most respects and Chabuata stands off a bit by itself but not very distant so far as morphology is concerned. Our genus Ceramica may have to sink as a synonym of Hyphilare or Aletia if one would stress structure rather than coloration or wing patterns. See, however, a discussion of Ceramica under section pertaining to male genitalia.

	Hyphilare	Ceramica	Chabuata ♀	Aletia ♀
Head:				
Vestiture	2	2	1	2
Compound eyes	3	3	3	3
Frons	1	1	1	1
Antennæ of the male	1, long hair beneath	1, long hair lateral setæ	×	×
Antenna of the female	1, cilia	1, cilia	1, cilia lateral setæ	1, cilia lateral setæ
Vestiture of the palpi	1	2	2	2
Ratio of the palpal segments ..	3	3	×	2
Proboscis	1	1	1	1
Thorax:				
Vestiture	2	2	2	2
Crests	2	5	5	2
Costa of the primaries	1	1	1	1
Apex of the primaries	1	1	3	1
Outer margin of primaries	1, straight	1, incurved	1, straight	1, incurved
Sc. and R. of secondaries	2	2	×	2
Fore leg—vestiture	1	1	1	1
“ “—structure	1	1	1	1
Middle leg—vestiture	1	1	1	1
“ “—structure	1	1	1	1
Hind leg—vestiture	1	1	1	1
“ “—structure	1	1	1	1
Abdomen:				
Vestiture	1 male, 4 female	6	4	1
Dorsal crests	2	2	3	2
Lateral crests	3 male, 1 female	3	1	1

Genus *Ulolonche* Smith

The type of this genus, *Ulolonche niveiguttata* Grote, exhibits many of the characters of the *Melanchra* group with the exception of the peculiar shape of the costa of the fore wings. It also appears to be related to the *Hyphilare* group. Owing to this dual relationship, the genus *Ulolonche* has been placed here between those two groups.

Synopsis of Morphological Characters

Head :

Vestiture 2, Compound eyes 3, Frons 1, Antennæ of the male 1 fine hair and lateral setæ beneath, in the female 1 ciliated and with lateral setæ beneath; Vestiture of the palpi 4, Ratio of the palpal segments 2, Proboscis 1.

Thorax :

Vestiture 3, Crests 3, Costa of the primaries 2, apex of primaries 2, outer margin of primaries 1 incurved, Sc. and R. of the Secondaries 2, Vestiture and structure of all legs 1.

Abdomen :

Vestiture 6, Dorsal crests 3, Lateral crests in male 3, in female 2.

Melanchra, *Meterana*, and *Hyssia*

The three genotypes—*Melanchra persicariæ* L., *Meterana pictula* White, and *Hyssia cavernosa* Evers—have at least one palpal segment clothed with a mixture of hair and scales and in this way at least they differ from the genotypes of the *Hyphilare* group. *Persicariæ* is European, *pictula* comes from New Zealand, and *cavernosa* is a Russian species. They are included here because the genera they represent have been erroneously associated with the genus *Mamestra*. In fact if we were to accept *persicariæ* as type of *Mamestra*, then *Melanchra* would sink as a synonym of that genus having the same species as its genotype. If we compare the three genotypes structurally, it will be noted that *Meterana* has five characters in common with *Melanchra* while *Hyssia* has only three. In making this comparison one should eliminate the six characters common to all three species. On

Synopsis of Morphological Characters

	Melanchra	Meterana	Hyssia
Head:			
Vestiture	3	3	2
Compound eyes	3	3	3
Frons	1	1	1
Antenna of the male	1 ciliated lateral setae	× 1 ciliated lateral setae	1 long hair lateral setae
Antenna of the female	1 ciliated lateral setae		1 ciliated lateral setae
Vestiture of the palpi	4	4	5
Ratio of the palpal segments	3	2	2
Proboscis	1	1	1
Thorax:			
Vestiture	3	2	2
Crests	5	2	5
Costa of the primaries	1	1	1
Apex of the primaries	2	3	2
Outer margin of the primaries	1 incurved	1 incurved	1 straight
Sc. and R. of the secondaries	2	2	2
All legs structure and vestiture	1	1	1
Abdomen:			
Vestiture	6	6	4
Dorsal crests	7	3	2
Lateral crests	2	3	2

Synopsis of Morphological Characters

	Neleucania	Anarta	Zosteropoda
Head:			
Vestiture	2	1	1
Compound eyes	3	3	3
Frons	1	1	1
Antenna of the male	1 ciliated	1 hair and lateral setae	1 hair, lateral mid ventral setae
Antennæ of the female	1 ciliated lateral setae	1 ciliated lateral setae	1 cilia lateral mid ventral setae
Vestiture of the palpi	1	4	3
Ratio of palpal segments	×	2	1
Proboscis	1	1	1
Thorax:			
Vestiture	2	2	1
Crests	6	3	1
Costa of primaries	4	4	4
Apex of primaries	3	1	3
Outer margin of primaries	1 incurved	1 incurved	1 incurved
Sc. and R. of the secondaries	×	2	1
Vestiture and structure of all legs	1	1	1
Abdomen:			
Vestiture	4	6	4
Dorsal crests	3	5	1
Lateral crests	1	2	1

the same basis *Meterana* and *Hyssia* have two characters in common. All this would indicate a close relationship among the three genera so far as their genotypes are concerned.

Neleucania, *Anarta* and *Zosteropoda*

The genotypes of these three genera are *Neleucania niveicosta* Smith, *Anarta myrtilli* Linn., and *Zosteropoda hirtipes* Grote. In these three species the costa of the primaries is concave, an unusual character in this subfamily. *Myrtilli* is the only European species the other two being native to the United States. All three genera are represented in this country however. *Neleucania* can be readily separated from the other two by the vestiture of the palpi. In this genus the palpal segments are clothed with scales only, in the other two at least one segment is covered with a mixture of scales and hair.

Subsection Ib Antenna of Male Wedge-shaped

In this substance the writer has placed fourteen genera one of which may have to be removed upon further study—genus *Borolia* Moore. All of the genotypes have much in common morphologically with the *Melanchra* group but there we find that the antennæ of the males, while filiform in structure, are more or less oval in cross-section while in this subsection—the *Hadena* like moths—the filiform antenna of the males is wedge shaped in cross section. Whether this is sufficient ground for separating the *Melanchra* and *Hadena* groups must be left to the reader. Probably it is best to consider this as an artificial grouping for convenience. The genotypes included in this subsection are as follows:

- Hadena* Schrank—type *cucubali* Schiff.
- Aethria* Hubner—type *serena* Schiff.
- Astrapetis* Hubner—type *dentina* Schiff.
- Dargida* Walk—type *grammivora* Walk.
- Diataraxia* Hub.—type *splendens* Hub.
- Eupsephopaectes* Gr.—type *procinctus* Gr.
- Crocigrapha* Gr.—type *normani* Gr.
- Aplecta* Gn.—type *nebulosa* Hufn.
- Eriopyga* Gn.—type *punctulum* Gn.

Pseudorthodes Morr.—*vecors* Gn.

Naesia Walk.—type *moesta* Walk.

Borolia Moore—*furcifera* Moore.

Meliana Curtis—*flammea* Curt.

Heliophila Hub.—*pallens* Linn.

These genotypes may be separated more or less satisfactorily in the following way:

- A. Primaries with the costal margin slightly convex.
 - 1. Legs compactly scaled Meliana
Some of the segments of the legs bearing hair and scales 2
 - 2. Apex of the primaries drawn to a point Eriopyga
Apex truncated 3
 - 3. All palpal segments bearing scales only Borolia
Some palpal segments bearing hair and scales Naesia
- B. Primaries with the costa straight.
 - 1. Vestiture of the head hair only Heliophila
Vestiture of the head hair and scales or scales 2
 - 2. No dorsal abdominal crests, wings short and stubby.
Pseudorthodes
Dorsal abdominal crests present, wings narrower Hadenia group

Meliana, Eriopyga, Borolia and Naesia

These four genotypes are grouped together on the basis of their convex costal margin. Meliana can be separated from the other three on the vestiture of the legs. All the legs of *Meliana flammea* are compactly scaled which is not a common character in this sub-family. The other three genotypes in this group have some portion of some of the legs covered with a mixture of hair and scales. *Meliana flammea* is a European species and the genus may be represented in this country. *Borolia furcifera* comes from India and is the type of a genus which is considered to be synonymic with Meliana. The closely scaled legs in Meliana would separate it from Borolia. Borolia however may stand very close to our genus Heliophila from which it differs in the form of the costal margin of the fore wing—convex in Borolia, straight in Heliophila. *Eriopyga punctulum* Gn. and *Naesia moesta* Walk. are both South American species typical of genera which have been confused with Himella and Pseudorthodes. Pseudorthodes with its short stubby wings, and Himella in which the antenna of the male is crenulated can not be confused with their South American neighbors.

Synopsis of Morphological Characters

	Eriopyga	Naesia	Borolia ♀	Meliana
Head:				
Vestiture	2	3	3	2
Compound eyes	3	3	3	3
Frons	1	1	1	1
Antenna of the male	2 hair and lateral setae	2 hair and lateral setae	×	2 hair and lateral setae
Antenna of the female	1 cilia and lateral setae	1 cilia and lateral setae	1 cilia and lateral cilia	1 cilia, lateral mid ventral setae
Vestiture of the palpi	2	4	2	2
Ratio of the palpal segments	×	2	3	3
Proboscis	1	1	1	1
Thorax:				
Vestiture	2	2	2	1
Crests	2	3	2	1
Costa of primaries	3	3	3	3
Apex of primaries	3	1	1	3
Outer margin of primaries	incurred	incurred	incurred	incurred
Sc. and R. of the secondaries	×	1	2	2
Vestiture of legs	1	1	1	2
Structure of legs	1	1	1	1
Abdomen:				
Vestiture	4	4	4	4
Dorsal crests	3	1	1	1
Lateral crests	1	1	1	1

Heliophila Hubner

The type of this genus is the European species *pallens* of Linnaeus. The genus is well represented in this country but many of the species are difficult to identify because they resemble each other so markedly. The genus *Leucania* of Ochsenheimer has *pallens* as its type so it sinks as a synonym of *Heliophila*.

Synopsis of Morphological Characters

Head:

Vestiture 1, Compound eyes 3, Frons 1, Antenna of the male 2 with hair and lateral setae, in the female 1 ciliated with lateral setae, Vestiture of the palpi 2, Ratio of the palpal segments 2, Proboscis 1.

Thorax:

Vestiture 2, Crests 1, Costa of the primaries 1, Apex of primaries 3, Outer margin of primaries straight, Sc. and R. of the secondaries 2, Structure and vestiture of all legs 1.

Abdomen:

Vestiture 4, Dorsal crests 1, Lateral crests 1.

Pseudorthodes Morrison

This genus has for its type the American species *vecors* Guenee. In many ways it resembles morphologically the genus *Crociographa* but the shorter more stubby wings of *vecors* will serve to separate the two genera.

Synopsis of Morphological Characters

Head:

Vestiture 2, Compound eyes 3, Frons 1, Antenna of the male 2 short hair and lateral setae, in the female 1 ciliated with lateral setae, Vestiture of palpi 4, Ratio of the palpal segments 1 and in some specimens 2, Proboscis 1.

Thorax:

Vestiture 2, Crests 3, Costa of the primaries 1, Apex of the primaries 2, Outer margin of primaries straight, Sc. and R. of the secondaries 1, Vestiture and structure of all legs 1.

Abdomen:

Vestiture 4 in one female 7, Dorsal crests 1, Lateral crests in the male 3, in the female 1.

The Hadena Group

Associated with *Hadena* are seven other genera all of which have much in common with *Hadena*. One is tempted to separate them on the basis of coloration and marking but if we try to establish genera on purely morphological characters then some, if not all, of the six genera will have to sink as synonyms of *Hadena*. Of the eight genotypes three are North American species—*Dargida grammivora*,* *Crocigrapha normani*, and *Eupsephopaectes procinctus*. The other five are European. Below is a synopsis of morphological characteristics of the eight types and the reader may use his own judgment as to which ones, if any, he wishes to consider valid and which he will look upon as synonymic with *Hadena*.

A summary of the morphology of the four European genera is presented in tabular form.

Dargida differs from *Hadena* in having two palpal segments bearing scales only, one thoracic crest, outer margin of the primaries incurved, and dorsal abdominal crests indistinct. *Eupsephopaectes* can be separated from *Hadena* in the following ways—vestiture of head scales, proximal and middle palpal segments bearing only scales, vestiture of the thorax hair and scales, and one dorsal abdominal crest. *Crocigrapha* shows many points of difference when compared with *Hadena*. *Crocigrapha* has the proximal and middle segments bearing scales only, vestiture of the thorax hair and scales, indistinct pro- and a more evident meta-thoracic crests, apex of the primaries rounded, abdomen covered dorsally and ventrally with hair and scales, and a single dorsal abdominal crest. These may be sufficient reasons for considering the three genera distinct from *Hadena*.

Subsection II Antenna of the Male Never Filiform

In this section are twelve genotypes the males of which have antennæ that vary from crenulate to bipectinate. All of these are quite distinct with the exception of *Monostola* which stands very close to our American genus *Nephelodes*. The twelve genera, their genotypes, and the habitat of the genotypes are presented.

* *gramminivora* (lapsus calami).

Synopsis of Morphological Characteristics

	Hadena	Dargida	Eupsephopaetes	Crocigrapha
Head:				
Vestiture	2	2	3	2
Compound eyes	3	3	3	3
Frons	1	1	1	1
Antenna of male	2 hair and lateral setae	as in Hadena	as in Hadena	as in Hadena
Antenna of female	1 cilia and lateral setae	as in Hadena	as in Hadena	as in Hadena
Vestiture of palpi	3	4	4	4
Ratio of palpal segments	3	3	2	2
Proboscis	1	1	1	1
Thorax:				
Vestiture	3	3	2	2
Crests	5	2	5	3
Costa of the primaries	1	1	1	1
Apex of primaries	1	1	1	2
Outer margin of primaries	straight	incurved	straight	straight
Sc. and R. of the secondaries	2	1	2	1
Vestiture and structure all legs	1	1	1	1
Abdomen:				
Vestiture	4	5♂ 4♀	4	6
Dorsal crests	7	2	4	3
Lateral crests	3♂ 1♀	3♂ 1♀	3	3

Synopsis of Morphological Characteristics

	Aethria	Astrapetis	Diataraxia	Aplecta
Head:				
Vestiture	2	2	3	3
Compound eyes	3	3	3	3
Frons	1	1	1	1
Antenna of male	2 hair no setae	as in Hadena	as in Hadena	2 ciliated lateral setae as in Hadenia
Antenna of female	as in Hadenia	as in Hadenia	as in Hadenia	
Vestiture of palpi	4	4	4	2
Ratio of palpal segments	2	2	3	2
Proboscis	1	1	1	1
Thorax:				
Vestiture	3	2	2	3
Crests	4	3	5	5
Costa of primaries	1	1	1	1
Apex of primaries	2	1	1	1
Outer margin of primaries	straight	incurved	straight	straight
Sc. and R. of secondaries	2	2	2	2
Vestiture and structure all legs	1	1	1	1
Abdomen:				
Vestiture	6	2♂ 4♀	4	6
Dorsal crests	2	7	7	3
Lateral crests	2	3♂ 2♀	2	1

Morrisonia Grote—type <i>evicta</i> Grt.	U. S. A.
Xylomyges Gn.—type <i>conspicillaris</i> Linn.	Europe
Himella Grt.—type <i>fidelis</i> Grt.	U. S. A.
Alysia Gn.—type <i>specifica</i> Gn.	Australia, New Zealand
Hyperepia Barnes & Lindsey—type <i>pi</i> B. & L.	U. S. A.
Nephelodes Gn.—type <i>emmedonia</i> Cram. (<i>minians</i> Gn.)	U. S. A.
Monostola Alpheraky—type <i>asiatica</i> Alph.	Asia
Characas Steph.—type <i>cespitis</i> W. V.	Europe
Haderonia Staud.—type <i>subarschanica</i> Staud.	Europe
Epineuronia Staud.— <i>popularis</i> Fab.	Europe
Acerra Grt.— <i>normalis</i> Grt.	U. S. A.
Stretchia Hy. Edw.—type <i>plusiaeformis</i> Hy. Edw.	U. S. A.

Remarks

A word or two regarding some of these genotypes may clear up a few questions in the mind of the reader. Both Smith and Guenee allowed some range of variation in the type of antenna to be found in the genus *Xylomyges*. Probably it would be best to restrict the genus to those species in which the antenna of the male is serrated. Hampson would place *conspicillaris* under the genus *Xylomania* but in the structure of the antenna of the male and female they are both quite distinct.

In the case of *Alysia*, Hampson would combine it with *Ulolonche* and make them synonymous with *Hyssia*. In the type of male antenna, *Alysia* is distinctive and probably stands close to our American genus *Himella*.

Nephelodes has at least one synonym—*Monosca* Walker. *Monosca*, like many of Walker's genera, is a monotypical genus with *subnotata* Walker as its type. According to Hampson *subnotata* Walker is a synonym of *emmedonia* Cramer (*minians* Gn.) so both *Nephelodes* and *Monosca* have the same genotype. *Monostola asiatica* is in coloration and marking very much like *emmedonia* but structurally there are some differences. The most outstanding differences are in the vestiture of the head, type of antennae in the males, development of the proboscis, and thoracic crests.

Synopsis of Morphological Characters

	<i>Morissonia</i> <i>evicta</i> Gt.	<i>Xylomyges</i> <i>conspicillaris</i> W. V.	<i>Himella</i> <i>fidelis</i> Gr.	<i>Alysia</i> <i>specifica</i>	<i>Hyperopia</i> <i>pi</i> B. & L. ♂	<i>Nephelodes</i> <i>minivans</i> Gn.	<i>Monostola</i> <i>asatica</i> Alph. ♂	<i>Charaeas</i> <i>cespitis</i> W. V.	<i>Haderonia</i> <i>subarschamica</i> Staud.	<i>Epineuronia</i> <i>popularis</i> Fab.	<i>Acerua</i> <i>normalis</i> Gt.	<i>Strephia</i> <i>plusiastiformis</i> H. Edw.
Head:												
Vestiture	2	2	2	1	3	2	1	2	2	2	1	2
Compound eyes	3	3	3	3	3	3	3	3	3	3	3	3
Frons	1	1	1	1	1	1	1	1	1	1	1	1
Antenna of male	5	4	6	7	12	11	23	20	14	24	15	13
Antenna of female	1	1	1c	1a	×	1b	×	1	1	3	5	8
Vestiture of palpi	4	4	4	4	4	2	4	4	4	2	2	5
Ratio of palpal seg.	2 and 3	2	1	2	2	2	2	2	1	2	1	5
Proboscis	1	1	1	1	1	1	2	2	1	2	1	1
Thorax:												
Vestiture	3	3	2	1	3	2	1	3	3	2	1	2
Crests	5	5	1	1	5	5	1	5	5	1	5	5
Primaries—costa	1	1	3	1	1	1	1	1	1	1	1	1
“ —apex	1	3	1	1	1	1	1	1	2	1	3	2
“ —outer margin	straight	straight	straight	incurved	straight	straight	straight	2	incurved	straight	slightly incurved	slightly incurved

Synopsis of Morphological Characters

	<i>Morrissonia</i> <i>evicta</i> Grt.	<i>Xylomyges</i> <i>conspicillaris</i> W. V.	<i>Himella</i> <i>fidelis</i> Gr.	<i>Alysia</i> <i>specifica</i>	<i>Hyperepia</i> <i>pi B. & L.</i> ♂	<i>Nephelodes</i> <i>minimus</i> Gn.	<i>Monostola</i> <i>asiatica</i> Alph. ♂	<i>Characas</i> <i>cespitis</i> W. V.	<i>Haderonia</i> <i>subarschamica</i> Staud.	<i>Epineuronia</i> <i>popularis</i> Fab.	<i>Acerra</i> <i>normalis</i> Grt.	<i>Strechia</i> <i>plusiaeformis</i> H. Edw.
Secondaries Sc. & R	2	1	1	1	2	2	1	1	1	1	1	1
All legs—structure	1	1	1	1	1	1	1	1	1	1	1	1, seen note
“ “ —vestiture	1	1	1	1	1	1	1	1	1	1	1	1
Abdomen:												
Vestiture	6	6	5♂ 4♀	2	4	4	6	4	6	6♂ 4♀	6	6
Dorsal crests	1♂ 3♀	3	1	1	3	4♂ 2♀	4	4♂ 2♀	6	3	3	3
Lateral crests	3♂ 1♀	3	3♂ 1♀	3	3	3♂ 1♀	1	1	1	3	3♂ 1♀	3♂ 1♀

Female antenna: (1) Filiform fine cilia beneath with lateral setae, (1a) as in (1) but flattened beneath, (1b) as in (1) but with mid ventral setae also, (1c) ventral surface covered with short hair lateral setae.

These would serve to separate ^{*}Nephelodes from Monostola but the two genera are very closely related.

Charaeas has been included because some writers have confused it with Mamestra. In the structure of the fore tibia, the type of male antennae, and other more minor differences the two genera are very distinct. Charaeas belongs here with this group of genera although it may not be represented in this country.

Haderonia has also been confused with Mamestra but a comparison of the two genotypes will serve to separate them easily.

Acerra, Stretchia, and Perigrapha are three genera very closely related and often confused. Perigrapha has been removed from this section on the basis of its frons. Acerra and Stretchia show some points of difference particularly in the form of the antennae of the male and female. Perigrapha serves as a link to connect this section with Section B.

Section B

The genotypes in this section are characterized by having the frons of various forms but never uniformly rounded. This section can be subdivided into two subsections as follows: Subsection I frons produced but not ornamented, and Subsections II frons bearing some form of ornamentation.

Subsection I

Subsection Ia Antenna of the male never simple.

In this section the writer has placed the following genera:

Perigrapha Lederer	type <i>i-cinctum</i> Schiff.	Europe
Xylomania Hampson	type <i>hiemalis</i> Grote	U. S. A.
Engelhardtia Barnes	type <i>ursina</i> Smith	U. S. A.
Lasiestra Hampson	type <i>phoca</i> Morsch.	North America
Eurypsycha Butler	type <i>similis</i> Butler	India

Perigrapha has many of the characteristics of Acerra and Stretchia but the slightly protuberant frons places it in this section. It serves to connect Sections A and B. Eurypsycha resembles Meliana in many respects but the shape of the frons and structure of the antennae of the male of this Indian genus removes it from Meliana section.

SECTION B

	Subsection Ia			Subsection Ib								
	<i>Perigrappa</i> <i>i-cinctum</i> Schiff.	<i>Xylomania</i> <i>hiemalis</i> Grote	<i>Engelhardtia</i> <i>ursina</i> Smith	<i>Lasiostra</i> <i>phoca</i> Mosch.	<i>Eurypsyche</i> <i>sumilis</i> Butler	<i>Cardipia</i> <i>irrisor</i> Ersch	<i>Trichocosmia</i> <i>inornata</i> Grote	<i>Barathra</i> <i>albicolon</i> Ochs	<i>Scotoگرامma</i> <i>submarina</i> Grote	<i>Dianthoecia</i> <i>carpohaga</i> Bork.	<i>Sideridis</i> <i>evidens</i> Hub.	<i>Neuria</i> <i>reticulata</i> Linn.
Head												
Vestiture	1	3	1	1	3?	2	3	2	1	2	2	2
Compound eyes	3	3	3	3	3	3	3	3	3	3	3	3
Frons	2	2	2	2	2	2	2	2	2	4	3	3
Antennæ of male	21	18	16	8	3	2a	1a	1	1c	1d	1d	2a
Antennæ of female	8	7	6	1a	x	1b	1c	1a	1b	1b	1b	1b
Vestiture of palpi	4	5	4	4	1	4	2	4	4	3	2	4
Ratio of palpal seg.	1	1 and 2	2	3	3	♂ 3♀	2	2	2	3	2	1
Proboscis	2	1	2	1	1	1	1	1	1	1	1	1
Thorax												
Vestiture	1	2	1	1	3	3	3	2	2	3	1	3
Crests	5	5	1	1	1?	1	5♂ 4♀	6	5	5	3	5
Costa of primaries	1	1	1	2	3	1	1	1	1	1	1	1
Apex of primaries	1	3	3	1	3	2	2	1	2	1	1	1

SECTION B

	Subsection Ia			Subsection Ib								
	<i>Perigrappa</i> <i>incinctum</i> Schiff.	<i>Xylomania</i> <i>hiemalis</i> Grote	<i>Engelhardtia</i> <i>ursina</i> Smith	<i>Lasestra</i> <i>phoca</i> Mosch.	<i>Eurypsyche</i> <i>similis</i> Butler	<i>Cardipia</i> <i>irrisor</i> Erseh	<i>Trichocosmia</i> <i>inornata</i> Grote	<i>Barathra</i> <i>albicolon</i> Ochs	<i>Scotogramma</i> <i>submarina</i> Grote	<i>Dianthoecia</i> <i>carpophaga</i> Bork.	<i>Sideridis</i> <i>evidens</i> Hub.	<i>Neurina</i> <i>reticulata</i> Linn.
Outer margin of primaries	2	1	1	2	2	2	2	1	2	1	2	2
Secondaries Sc. & R. ...	1	1	1	1	2	1	2	1	1	1	1	1
Vestiture of all legs ..	1	1	1	1	1	1	1	1	1	1	1	1
Structure of all legs ..	1	1	1	1	1	1	1	1	1	1	1	1
Abdomen												
Vestiture	7	6	6	6	x	4	7	3	4	4	4	4
Dorsal crests	3	3	1	3	x	2	3	3	3	3	3	3
Lateral crests	3	3	1	2♂ 1♀	x	2	1	1	1	3♂ 1♀	2	3♂ 1♀

Antenna of male 1a = hair, lateral no mid ventral setae; 1b as in 1a but with mid ventral setae; 1c hair no setae; 1d hair lateral setae; 2a wedge shaped, long hair, lateral setae.

Antenna of female—1a = ciliated, lateral and mid ventral setae; 1b ciliated lateral setae only; 1c short hair, lateral, one mid ventral setum.

SECTION B

Subsection IIa		Subsection IIb
<i>Xanthopastes timas</i> Cram.	<i>Craterestra lucina</i> Druce	<i>Discestra chartaria</i> Grote
		<i>Cea immacula</i> Grote
		<i>Trichoclea decepta</i> Grote
		<i>Ichneutica cernanias</i> Meyrick
		<i>Miodera stigmata</i> Smith
Head		
Vestiture	2	4
Compound eyes	3	3
Frons	7	9
Antennæ of male	1a	17
Antennæ of female	1	3
Vestiture of palpi	5	4
Ratio of palpal seg.	2	1
Proboscis	2	1
Thorax		
Vestiture	2	3
Crests	4	2
Costa of primaries	3	1
Apex of primaries	2	2

SECTION B

Subsection IIa		Subsection IIb	
<i>Xanthopastes</i> <i>timas</i> Cram.	<i>Graterestra</i> <i>lucina</i> Druce	<i>Discestra</i> <i>chartaria</i> Grote	<i>Cea</i> <i>immacula</i> Grote
<i>Trichoclea</i> <i>decepta</i> Grote	<i>Ichneutica</i> <i>cervanias</i> Meyrick	<i>Miodera</i> <i>stigmata</i> Smith	
Outer margin of primaries	straight	straight	incurved
Sc. and R. of secondaries	2	1	1
Vestiture of all legs	1	1	1
Structure of all legs	1	1 (see Note)	1
Abdomen			
Vestiture	4	4	6
Dorsal crests	3	3	2
Lateral crests	1	2	1

Note: In one pair of *Trichoclea decepta*, the fore legs had type 4 structure.
Antenna of Male 1a, hair no setæ; 1b, hair lateral setæ; 2a, wedge shaped hair no setæ; 2b, wedge, lateral setæ; 2c, wedge ciliated lateral setæ.
Antenna of Female 1 ciliated with lateral setæ.

Synopsis of Morphological Characters (See Chart)

Subsection Ib Antenna of the male filiform (simple).

In this section the writer places the following:

Cardepia Hampson	type <i>irrisor</i> Ersch	Russia, Turkestan
Trichocosmia Grote	type <i>inornata</i> Grote	U. S. A.
Barathra Hubner	type <i>albicolon</i> Ochs	Europe
Scotogramma Smith	type <i>submarina</i> Grote	U. S. A.
Dianthæcia Boisd.	type <i>carpophaga</i> Bork.	Europe
Sideridis Hubner	type <i>evidens</i> Hubner	Europe
Neuria Guenee	type <i>reticulata</i> L. (saporariae De.G.)	Europe

Remarks

Barathra is included here because many writers make it a synonym of Mamestra. Their reason is based on the fact that they consider brassicæ the types of both genera. *Brassicæ* is the type of Mamestra but *albicolon* is the type of Barathra by elimination. *Albicolon* does not have the claw on the fore tibia and cannot be included in Mamestra.

Subsection II

In this subsection the genotypes have the frons either ornamented or excavated. They fall naturally into two groups on the bases of the antennæ of the male.

Subsection IIa

The males in this subsection have some form of simple antennæ. The frons may bear a knob-like protuberance or some type of heart-like prominence. So far as the writer knows, the antennæ of the female is always simple. All of the genera are American and their types are to be found in the United States. For a more detailed discussion of the other morphological characteristics the reader is referred to the chart. *Regnatrrix* Grote is the same as *timais* Cramer, so *Philochrysa* is a synonym of *Xanthopastes*, both genera having the same species for their types.

Subsection IIb

In this subsection neither males nor females have simple antennæ. Here the writer places two genera:

Ichneutica Meyrick	Type <i>ceraunias</i> Meyrick	New Zealand
Miodera Smith	Type <i>stigmata</i> Smith	U. S. A.

Incheutica has been included in this article because it has been considered by some as being synonymic with the genus *Leucania*. In the shape of the frons, and in the structure of the antennæ of the male, it is quite distinct and probably has no representatives in this country. For more details concerning the morphology of these genotypes see the chart.

The Male Genitalia

A study of the male genitalia was made wherever material was available. There is no doubt that these structures exhibit some characteristics of generic value but many of the differences between male genitalia are purely specific and not generic. In order to separate the specific from the generic one should study the genitalia of all the species of all the genera included in this article. Since it was not possible to do this, the writer has not attempted to use the genitalia in his classification. They should, however, form a working basis for future study.

In describing the various parts the writer has followed the nomenclature of F. N. Pierce in his excellent article, "The Genitalia of the Noctuidæ." Pierce's terminology (with modifications from Walker and Crampton) is as follows:

Uncus: (Epiandrium or Epiproct in part) This is a dorsal appendage of the tenth somite. It may be simple, cygnated, tongue shaped, diamond form, spatulate, or forked (mandibulate).

Peniculus: a lobed process on either side of the tegumen which bears a brush of long hair.

Scaphium: a process on the upper side of the anus.

Subscaphium: a process attached to the lower surface of the anus.

Harpe: (Gonapophyses or Gonostyli) Two wing like projections one on each side below the tegumen. The most distal portion Pierce calls the Cucullus. This may be peaked, bifurcate, trigonate, or rounded—the latter term includes the battledore type of Pierce.

Corona: a row of incurved spines at the distal margin of the Harpes.

Marginal Spines: long slender spines on the distal margin of the Harpes.

Protuberances: this term includes the clasper and ampulla arising from the Harpe.

Editum: a finely spined prominence arising usually near the ampulla. This is not always easy to show in the figures.

Clavus: a prominence arising from the base of the Harpe. It may be brush form, rounded, produced, or scobinated.

Ædœagus: the penis sheath which may be ornamented anywhere along its length or at the orifice.

Vesica: an eversible sac sometimes provided with spines or cornuti or other ornamentation. This is not always easy to see, for it may be turned back into the ædœagus.

Juxta: (Pseudosternite ?) Beneath the anal aperture a sheath through which the ædœagus passes. Sometimes this sheath is heavily sclerotized.

Vinculum: (The ninth sternite) A ventral sclerotized band or ring.

Group I

Mamestra brassicæ Linn. Fig. 4B.

Uncus—tongue shaped; Peniculus—present; Scaphium—slight indications of its presence; Subscaphium—also slightly evident; Harpe—trigonal; Marginal spines—absent; Corona—present; Protuberance—a flap attached to the Harpe; Editum—present; Clavus—slightly produced; Ædœagus—orifice with a hook on one side; Vesica—probably bearing two small cornuti.

Group II

Of the three genotypes included in this group, the genitalia of only two can be illustrated and described.

Ommatostola lintneri Gr. Fig. 12A.

Uncus—simple; Peniculus—present; Scaphium—absent; Subscaphium—absent; Harpe—tends to be trigonal; Marginal spines—present; Corona—present; Protuberances—a very small, poorly chitinized rod and a stiff curved strap; Editum—present;

Clavus—rounded; *Ædæagus*—orifice scobinated on one side; Vesica—not ornamented.

Buchholzia colorada Sm. Fig. 16A.

Uncus—tongue shaped; Peniculus—present; Scaphium—absent; Subscaphium—absent; Harpe—flattened, very irregular along its edge; Pollex—present; Marginal spines—a few; Corona—a partial; Protuberances—a weak rod and a thick scleritized rod; Editum—present; Clavus—produced and bearing a curved strap-like organ; *Ædæagus*—orifice provided with a hook laterally; Vesica—with a band of teeth.

Group III

Four genera constitute this group but only three of them can be figured. The genitalia of *artega* Barnes and *semiaperta* Morr. show marked resemblances in the shape of their harpes while *dentatella* Grote seems to stand off by itself.

(*To be concluded*)